

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) A method for managing traffic in a communications network comprising acts of:

(a) providing, in a network device, a cache containing at least predefined characteristics associated with packets and actions paired with selected ones of said predefined characteristics;

(b) receiving at least one ~~packet~~ of the packets in said network device;

(c) selecting, from said received packet, characteristics similar to the at least predefined characteristics;

(d) correlating the characteristics selected from said received packet with the predefined characteristics; and

(e) using results from the ~~correlation~~ correlating step to ~~process~~ perform Layer 3 or higher classification of the received packet.

2. (Original) The method of claim 1 wherein the process includes enforcing the paired action against the received packet if the characteristics of said received packet matches the at least predefined characteristics.

3. (Original) The method of claim 1 or claim 2 wherein the at least predefined characteristics include Internet Protocol (IP) Destination Address (DA), IP Source Address (SA), Transmission Control Protocol (TCP) Destination Port (DP) and TCP Source Port (SP).

4. (Original) The method of claim 1 wherein the correlating act includes comparing.
5. (Currently amended) A method comprising ~~the~~ acts of:
providing in a memory a mapping of predefined characteristics associated with packets and actions to be performed;
receiving packets to be classified;
correlating selected characteristics of received packets with the predefined characteristics; and
performing stored actions on said received packets, if the selected characteristics match the predefined characteristics, wherein the performed stored actions include Layer 3 or higher frame classification actions.
6. (Original) The method of claim 5 wherein the correlating act includes comparing.
7. (Original) The method of claim 5 wherein the predefined characteristics include Source Address (SA), Destination Address (DA), Source Port (SP) and Destination Port (DP).
8. (Original) The method of claim 5 wherein the received packets include data packets.
9. (Currently amended) The method of claim 5 wherein the stored ~~action~~ actions associated with predefined characteristics are updated only from a first packet of a group of packets.
10. (Original) The method of claim 9 wherein the stored actions are being performed on all packets following the first packet of the group of packets.

11. (Currently amended) A system including
a processor; ~~and~~
a cache operatively coupled to said processor, said cache storing a mapping between predefined characteristics of packets and actions wherein said processor executes a first program that causes said processor to correlate characteristics of selected packets with the predefined characteristics and enforcing on said selected packets actions associated with predefined characteristics if characteristics from the selected packets match the predefined characteristics; and
a memory operatively coupled to said processor and storing therein:
a first data structure for a full packet search wherein said processor executes a second program that causes said processor to access the first data structure and imposing on said selected packet an action stored in said first data structure if a mismatch occurs between the predefined characteristics and the characteristics from the selected packets; and
a second data structure that includes an aging algorithm for aging the cache, the aging algorithm initializes an expiration timer, decrements the expiration timer by a check time interval that is less than a current value of the expiration timer, reviews a Layer 3 or Layer 4 database for a change to the Layer 3 or Layer 4 database, and purges the cache if a change has been made during the check time interval.
12. (Original) The system of claim 11 wherein the predefined characteristics include Source Address (SA), Destination Address (DA), Source Port (SP) and Destination Port (DP).
13. (Original) The system of claim 11 wherein the processor includes a network processor.

14. (Cancelled).
15. (Currently amended) The system of ~~claims~~ claim 11 ~~or 14~~ wherein the selected packet includes received packets.
16. (Currently amended) The system of claim ~~[[14]]~~ 11 wherein the second program includes a full match algorithm.
17. (Currently amended) The system of claim ~~[[14]]~~ 11 wherein the second program includes a Longest Prefix Match algorithm.
18. (Currently amended) The system of claim ~~[[14]]~~ 11 wherein the second program includes a Software Managed Tree algorithm.
19. (Currently amended) The system of claim ~~[[14]]~~ 11 wherein the memory is internal to the processor.
20. (Currently amended) The system of claim ~~[[14]]~~ 11 wherein the memory is external to the processor.
21. (Currently amended) The system of claim ~~[[14]]~~ 11 wherein the data structure includes a Direct Table and Patricia Tree.
22. (Currently amended) A system including

a memory that stores a mapping between predefined characteristics of packets and actions to be performed for a subset of the set of all characteristic values, wherein the actions to be performed are Layer 3 or higher classification actions; and

a controller that correlates characteristics in a received packet with the predefined characteristics and performing the actions on said received packet if the characteristics match the predefined characteristics.

23. (Currently amended) A computer-readable medium comprising computer-executable instructions that, when executed by a processor, produce a method that comprises: A program product including

~~a medium on which a computer program is recorded, said program including instructions that correlate~~ correlating characteristics of a received packet with characteristics in a table, said table containing a subset of all possible characteristic values; and

~~instructions to enforce~~ enforcing an action stored in said table on the received packet if the characteristics of the received packet and the characteristics in the table match, wherein the action facilitates Layer 3 or higher packet classification.

24. (Currently amended) The ~~program product~~ computer-readable medium of claim 23 further including instructions to generate the table containing the characteristics and associated actions.

25. (Currently amended) The ~~program product~~ computer-readable medium of claim 24 ~~further still~~ including additional instructions to maintain the table.

26. (Currently amended) The ~~program-product~~ computer-readable medium of claim 25 wherein the instructions to maintain further includes an instruction to delete aged entries and insert new entries.

27. (Original) The method of claim 1 wherein the at least one packet received in (b) satisfies a Frequent Flyer criteria of being one packet within a short burst of packets belonging to the same session.

28. (Currently amended) The system of claim 22 further including an aging mechanism operatively coupled to the memory, said aging mechanism periodically deleting old entries from said memory.

29. (Original) The system of claim 28 wherein old entries are being deleted based upon a predefined criteria.

30. (Currently amended) The system of claim 29 wherein the predefined criteria includes deleting a least recently used entry when said memory is full and a new entry needs to be added.

31. (Currently amended) A method of classifying packets in a communications network comprising acts of:

- (a) receiving packets in a network device;
 - (b) determining data packets present in received packets;
 - (c) providing a cache in which predefined characteristics of packets and actions associated with selected ones of the predefined characteristics are stored;
- for each data packet so determined, correlating selected characteristics of said each data packet with the predefined characteristics in said cache; and

for each data packet with selected characteristics matching one of the predefined characteristics imposing on said each data packet the action associated with said one of the predefined characteristics, wherein the packets include TCP/IP packets, and wherein the determining act further includes the acts of:

examining control bits in the TCP header;

if selected ones of said control bits are set to a first state, examining a length field in the IP header to determine its value;

multiplying a value in the data offset field in the TCP header by 4; and

subtracting the result of the multiplication from the value in the length field.

32. (Cancelled)

33. (Cancelled)

34. (Currently amended) The method of claim [[33]] 31 wherein the first state includes logical "0".

35. (Currently amended) The method of claim [[33]] 31 wherein the selected ones of said control bits include SYN, FIN and RST.